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Appl. No. 10/687,768  
Pre-Appeal Brief Request for Review

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On: November 17, 2006

By: Debra Colonna  
Debra Colonna

IN THE UNITED STATES  
PATENT AND TRADEMARK OFFICE

Appl. No. : 10/687,768  
Applicant : Yukio NARUKAWA et al.  
Filed : 20 Oct. 2003  
TC/A.U. : 2814  
Examiner : Hoa B TRINH  
Atty. Docket : AZU.002

Title: NITRIDE SEMICONDUCTOR DEVICE,  
AND ITS FABRICATION PROCESS

**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

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Sir or Madam:

In response to the final Office Action of 17 May 2006 and Advisory Action dated 03 October 2006, Applicants request review of the final rejection in the above referenced application. No amendments are being filed with this request. This paper is being filed with a Notice of Appeal.

**This review is requested for the reasons stated on the attached sheets.**

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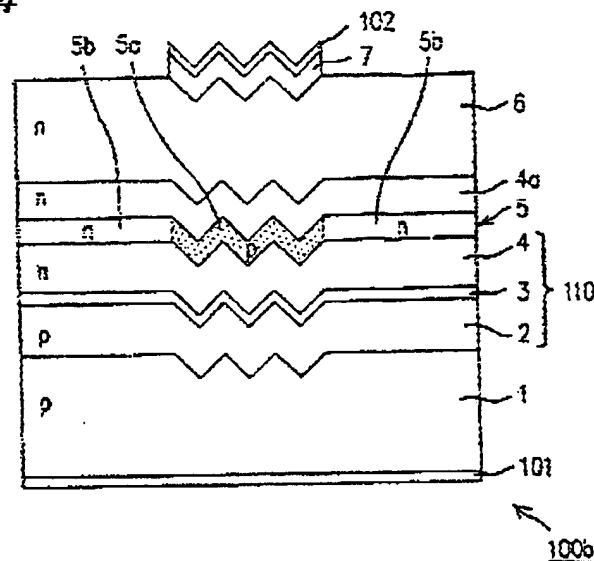
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**The Examiner Has Made Clear Errors**  
**In the Rejections of Claims 1, 2, 4-10, 12, 13, and 19-21**

**Claim 6**

The final Office Action rejected claim 6, stating that "Hosoba discloses that at least one of surfaces of the n-type *semiconductor layer 250* (fig. 4) contiguous to the *active layer 310* (fig. 4) is a surface vertical to the major surface of the n-type semiconductor layer 250." (See, final Office Action, page 3, paragraph 2, emphasis added). Fig. 4 of Hosoba is shown below.

**FIG. 4**



By inspection of Fig. 4, it can clearly be seen that Fig. 4 of Hosoba **does not contain any elements labeled 250 or 310**. Accordingly, the rejection of claim 6 is factually defective and should be withdrawn.

**Claim 19**

The final Office Action rejected claim 19, stating that "Hosoba does not explicitly teach that the M or A planes of the active layer make an angle of 30, 60, ..., 300, or 330 degrees, as viewed from the upper surface of the first conductive layer 250 (fig. 4)." (See, final Office Action, page 6, last paragraph).

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Again, by inspection of Fig. 4 of Hosoba shown above, it can clearly be seen that Hosoba does not contain any element labeled 250. Accordingly, the rejection of claim 19 is factually defective and should be withdrawn.

Moreover, claim 19 recites, among other things, recesses having a "*repetitively corrugated shape* with back-to-back side face angles of 120° and 240°" (emphasis added). One embodiment of the invention including this feature is shown in Fig. 9 of the present application. The final Office Action **fails to even address this feature**, and therefore the rejection of claim 19 is further defective and should be withdrawn.

#### Claim 13

Claim 13 recites "wherein the active layer emits light components having two or more *different major peak wavelengths*, and the light components are *mixed* to produce a color." (emphasis added). Hosoba fails to recite this feature. Instead, Hosoba only discusses emitting light with one peak wavelength: "pure green emitted light...at a peak wavelength of 555nm" (See, Hosoba at col. 25, lines 45-47). Accordingly, the rejection of claim 13 is defective and should be withdrawn.

#### Claim 9

Claim 9 recites "wherein the active layer comprises a plurality of M or A planes that intersect each other at angles of 30°, 60°, 90°, 120°, 150°, 210°, 240°, 270°, 300° or 330°, as viewed from an upper surface of the n-type semiconductor layer." Exemplary embodiments of this feature are illustrated in FIG. 2 of the present application. Hosoba and Romano both fail to disclose M or A planes having **any intersection whatsoever** as viewed from an upper surface of an n-type semiconductor layer. Accordingly, the rejection of claim 9 is defective and should be withdrawn.

#### Claim 21

Claim 21 recites "wherein the recess is one of a plurality of *triangle shaped recesses* formed in the n-type semiconductor layer." (emphasis added). Exemplary

embodiments of this feature are disclosed in FIG. 1 of the present application. However, Hosoba completely fails to disclose **any triangle shaped recesses** and therefore the rejection of claim 21 is factually defective and should be withdrawn.

### Claim 1

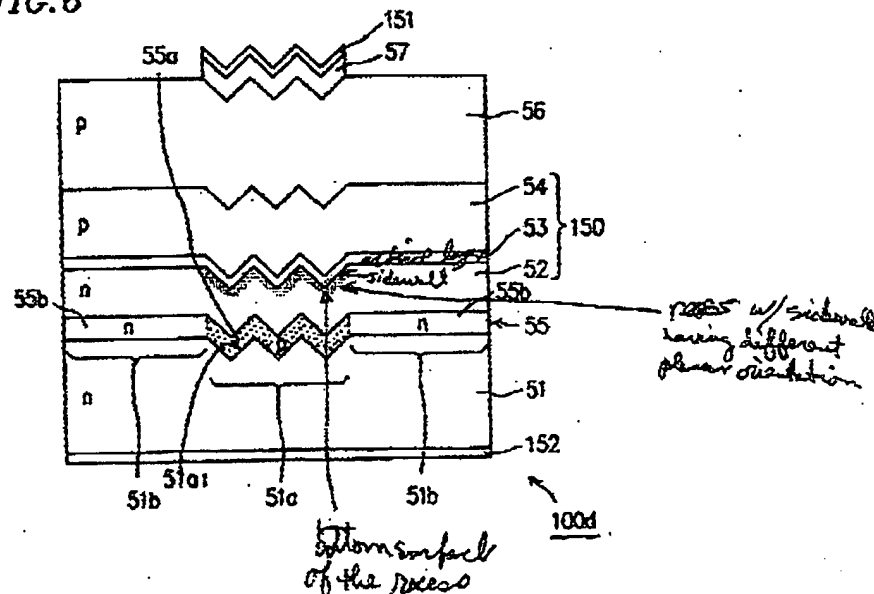
Among other things, claim 1 recites "a recess formed on a major surface of [an] n-type semiconductor layer, the recess having a **bottom surface** and sidewalls with a **different planar orientation** from the bottom surface" (emphasis added). One embodiment of such a feature is shown in FIG. 5 of the present application.

Applicants respectfully submit that Hosoba does not disclose such a feature.

The Examiner maintains that FIG. 6 of Hosoba shows a recess having a bottom surface and sidewalls and states that "the bottom of the recess has a bottom surface regardless of the size of the surface". (See, Advisory Action, page 2). However, the Examiner does not demonstrate or even allege that the so-called recess in Hosoba has a bottom surface that is **planar** or a bottom surface having a particular **planar orientation**. Accordingly, the rejection of claim 1 is defective and should be withdrawn.

Fig. 6 of Hosoba is included below, together with the Examiner's handwritten annotations.

**FIG. 6**



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As seen in FIG. 6 and as described in the disclosure of Hosoba, "each slope of the V-grooves 51a<sub>1</sub> [and therefore the V-grooves in layer 52] has an orientation of a (111) A plane." (See, Hosoba at col. 24, lines 28-31). In other words, the so-called recess in layer 52 of Hosoba is created by performing crystal growth on substrate 51 using "an MOCVD method during [a] first crystal growth step". (See, Hosoba, col. 25, lines 5-8). As a result, two crystal planes are formed by the so-called recess, both planes having an "A plane" crystal orientation. Because the so-called recess in FIG. 6 in Hosoba DOES NOT contain an additional "bottom surface" having a different planar orientation from the two crystal planes, the rejection of claim 1 is based on a **clear factual error** regarding the disclosure of Hosoba.

Accordingly, for at least these reasons, Applicant respectfully submits that the rejection of claim 1 is defective and should be withdrawn.

Claims 2 and 4-10, 12-13, and 19-21

Claims 2 and 4-10, and 19-21 depend from claim 1 and are deemed patentable for at least the reasons set forth above with respect to claim 1.

**CONCLUSION**

In view of the foregoing explanations, Applicants respectfully request that the prior art rejections of claims 1, 2, 4-10, 12, 13, and 19-21 be withdrawn and the claims allowed or the application returned to the Examiner for further prosecution.

Respectfully submitted,

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Date: 17 November 2006

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